Forklift Alternators and Starters

Forklift Starters and Alternators - A starter motors today is normally a permanent-magnet composition or a series-parallel wound direct current electrical motor together with a starter solenoid mounted on it. Once current from the starting battery is applied to the solenoid, basically via a key-operated switch, the solenoid engages a lever which pushes out the drive pinion which is positioned on the driveshaft and meshes the pinion utilizing the starter ring gear that is seen on the flywheel of the engine.

As soon as the starter motor begins to turn, the solenoid closes the high-current contacts. Once the engine has started, the solenoid has a key operated switch that opens the spring assembly so as to pull the pinion gear away from the ring gear. This particular action causes the starter motor to stop. The starter's pinion is clutched to its driveshaft by an overrunning clutch. This permits the pinion to transmit drive in only one direction. Drive is transmitted in this way via the pinion to the flywheel ring gear. The pinion remains engaged, for instance as the driver did not release the key as soon as the engine starts or if there is a short and the solenoid remains engaged. This actually causes the pinion to spin separately of its driveshaft.

This aforementioned action prevents the engine from driving the starter. This is an important step since this particular type of back drive would allow the starter to spin so fast that it can fly apart. Unless modifications were made, the sprag clutch arrangement would preclude using the starter as a generator if it was utilized in the hybrid scheme discussed earlier. Typically a standard starter motor is designed for intermittent use which will prevent it being utilized as a generator.

Hence, the electrical parts are designed to be able to work for roughly less than 30 seconds in order to prevent overheating. The overheating results from too slow dissipation of heat because of ohmic losses. The electrical components are designed to save cost and weight. This is truly the reason most owner's handbooks meant for vehicles recommend the operator to stop for at least 10 seconds right after each and every ten or fifteen seconds of cranking the engine, whenever trying to start an engine that does not turn over right away.

The overrunning-clutch pinion was introduced onto the marked in the early 1960's. Prior to the 1960's, a Bendix drive was used. This drive system works on a helically cut driveshaft which has a starter drive pinion placed on it. When the starter motor begins spinning, the inertia of the drive pinion assembly allows it to ride forward on the helix, hence engaging with the ring gear. As soon as the engine starts, the backdrive caused from the ring gear allows the pinion to exceed the rotating speed of the starter. At this point, the drive pinion is forced back down the helical shaft and hence out of mesh with the ring gear.

During the 1930s, an intermediate development between the Bendix drive was developed. The overrunning-clutch design which was made and launched during the 1960s was the Bendix Folo-Thru drive. The Folo-Thru drive has a latching mechanism along with a set of flyweights in the body of the drive unit. This was better because the typical Bendix drive utilized in order to disengage from the ring when the engine fired, even if it did not stay running.

Once the starter motor is engaged and begins turning, the drive unit is forced forward on the helical shaft by inertia. It then becomes latched into the engaged position. When the drive unit is spun at a speed higher than what is achieved by the starter motor itself, like for instance it is backdriven by the running engine, and next the flyweights pull outward in a radial manner. This releases the latch and allows the overdriven drive unit to become spun out of engagement, therefore unwanted starter disengagement could be avoided prior to a successful engine start.